

In re Application of :PATENT APPLICATION  
(Patents/patent new8/resp3)

WILLIAM H. VELKE :METHOD AND DEVICE TO IMPROVE  
:THE RATIO OF OXYGEN MASS VERSUS  
:FUEL MASS AT IGNITION IN  
:COMBUSTION MECHANISMS OPERATING  
:WITH FLUID HYDROCARBON FUELS

Application No.: 10/798,292  
Art Unit: 3749 :  
pending :

**RESPONSE TO OFFICE ACTION – CONFIRMATION No: 6440**

**Notice of Non-Compliant Amendment dated 06/20/05**

June 30, 2005

Campbellville, Ontario, Canada

Hon. Commissioner of Patents and Trademarks

Washington, D.C. 20231

**RECEIVED**

**JUL 20 2005**

Sir / Madam:

**TECHNOLOGY CENTER R3700**

Applicant herewith responds to the "Notice of Non-Compliant Amendment" dated June 20, 2005, concerning the following items:

- 1) C Amendments to the specification must be made by replacing a paragraph and requesting the Examiner to make the required corrections accordingly, rather than providing replacement pages;

Art Unit 3749

3) C Clarification of drawing pages and discussion as to changes made:

Applicant, in his previous response, had provided both a change in the drawings and a change in the description of the invention in addition to providing the argument that the Examiner was in error when raising his objections, and depending on the Examiner's acceptance or rejection thereof, Applicant would base a final decision. The Examiner appears to have accepted Applicant's argument and has agreed to have made an error.

Nevertheless, Applicant has decided to provide an additional reference to the insulating material in the drawing description and in drawing page 1, which material is already detailed on page 5 of the disclosure, first paragraph, citing "The heat exchanger assembly may in certain applications incorporate a heat equaliser segment from heat storage material, as part of the heat exchanger assembly". Wherein a "heat storage material" is recognised by anyone familiar in the art as a preferred and most effective insulating material, which is now further identified through reference 12 in drawing 1.

4) C Each claim must be provided with the proper status identifier:

Accordingly, Applicant has attached a replacement claims amendment in accordance with the requirements.

Applicant is attaching the requested corrections hereto and is responding thereby as required so that the Examiner should now be able to move this Application to allowance.

Signed this 30<sup>th</sup> day of June, 2005,



William H. Velke

Applicant

Attachments:      Description Corrections;      Corrected Listing of Claims

On the Title Page of the application, please change the two words HYDRO CARBON to a single word HYDROCARBON in the title of the invention:

**TITLE:** METHOD AND DEVICE TO IMPROVE THE  
RATIO OF OXYGEN MASS VERSUS FUEL MASS  
AT IGNITION IN COMBUSTION MECHANISMS  
OPERATING WITH FLUID ~~HYDRO CARBON~~ HYDROCARBON FUEL

On Page 1 of the application, last paragraph, please change the word powr to power:

The Transportation Technologies / Heavy Vehicles Industry is presently investigating the use of natural gas as an alternative fuel for the transportation sector. To improve the ~~powr~~ power output of such natural gas engines, it is testing a second-stage intercooler for LNG (liquid natural gas) fueled heavy vehicles. The concept uses LNG fuel to cool the intake air to increase combustion air density relative to fuel density and thereby achieving better engine performance, but without stating any specific temperature level.

On Page 4 of the application, first paragraph, change the word affective to effective:

At present, it is still believed in the gas combustion appliance industry that pre-heating of fuel, as contemplated in this invention, is not ~~affective~~ effective to cause a fuel ignition improvement and thereby increase combustion dynamics. In fact, a correction formula is always employed in the industry to eliminate any variance in fuel efficiency calculations due to a change in fuel temperature or fuel density. Such correction formula calculation may be found in the "Gas Engineers Handbook", Ninth Printing, Chapter 8, "Gas Calorimetry", Pages 6-42.

On Page 8 of the application, first paragraph, insert the phrase "all equipped with insulation 12":

Referring now to **Figure 1** of the drawings, there is shown, in schematic view, a combustion mechanism with a burner arrangement **4** located in combustion area **3**. Incoming fuel is routed through fuel conduit **1** to the first heat exchanger **7** for the purpose of increasing the density of the combustion air **9** flowing through air inlet duct **8** for mixing with fuel at ignition in burner area **4**. The fuel is then routed from the first heat exchanger **7** through the second heat exchanger **6**, all equipped with insulation 12, designed for the purpose reducing the density of the fuel using waste heat from the combustion mechanism's flue stack area **10**. The density reduced fuel is then routed through an insulated conduit **2** to combustion area **3** for mixing with the density increased combustion air at ignition in burner area **4**. The fuel in this application is employed to provide the density increasing means at heat exchanger **7** for improving oxygen mass in the combustion air **9**. This is especially feasible when a fuel like liquid natural gas or propane and the like is used, which flows at low temperature and converts to a gaseous state at even lower temperature. Location **5** in the combustion mechanism always indicates the theoretical energy transfer or working area of the combustion mechanism.